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### **Recommended Approach for Diesel TAC Needs Assessment Report**

August 18, 1999

Working with the Stationary Source Subcommittee, the Air Resources Board (ARB) must develop a report on the need for further control of particulate emissions from diesel-fueled engines. During the four previous meetings, many Stationary Source Subcommittee members expressed concern over, and requested clarification of, the approach that ARB staff were pursuing to develop the needs assessment report. We have considered the comments and suggestions and have developed an alternative approach that addresses the concerns. The ARB staff's suggested approach is summarized below and explained in detail on the following pages.

#### **Initial Approach**

- ◆ Review inventory and identify categories based on equipment use (e.g. generator, pump, etc...), horsepower and operating characteristics
- ◆ Model exposure and risk for each category, and identify categories that warrant further review
- ◆ Collect control technology information and rank available control measures
- ◆ Evaluate and select control measures based on risk reduction, feasibility and cost effectiveness
- ◆ For each category, determine the reduction in risk from implementing control measures
- ◆ Draft needs assessment report

#### **Recommended Approach**

- ◆ Establish categories based on how often equipment is used (backup, low use, high use)
- ◆ Estimate population, determine emission factors and estimate current emissions for each category
- ◆ Collect information and evaluate control technologies
  - Compare control technologies
  - Identify feasible / cost effective technologies by category (Top Down)
- ◆ Estimate emission reduction
- ◆ Evaluate exposure and risk
  - Current inventory and emissions
  - Future inventory and emissions based on existing measures
  - Future inventory and emissions based on feasible / cost effective technologies
- ◆ Select and rank control technologies
- ◆ Draft needs assessment report

#### **Key Differences**

- ◆ Fewer source categories and fewer modeling scenarios
- ◆ Control measures based on evaluation of emission reduction, feasibility & cost effectiveness
- ◆ Control measure NOT based on risk unless residual risk is significant

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**Needs Assessment Report - Development Outline Summary**

(August 18, 1999)

<b>Task</b>	<b>Description</b>
<b>I</b>	Collect Information
	- Inventory (current & future)
	- Emission Factors (stationary & portable)
	- Available Control Measures
<b>II</b>	Establish Categories & Estimate Population
<b>III</b>	Estimate Emissions
	- Current Emissions
	- Future Emissions Based on Existing Measures
<b>IV</b>	Evaluate Control Measures
	- Summarize Control Measures
	- Address: Emission Reduction, Cost, Feasibility, Compatibility, & Adverse Impacts
	- Compare Available Control Measures
	- Identify Feasible/Cost Effective Tech. For Each Category
<b>V</b>	Estimate Emission Reduction
	- Feasible/Cost Effective Control Measures
<b>VI</b>	Evaluate Exposure & Risk (model representative engines)
	- Current Inventory & Emissions
	- Future Inventory & Emissions Based on Existing Measures
	- Future Inventory & Feasible/Cost Effective Control Measures
<b>VII</b>	Select & Rank Control Measure(s)
<b>VIII</b>	Draft Needs Assessment Report

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### **Needs Assessment Report - Development Outline**

The outline presented below describes the Air Resources Board staff's proposal to prepare the report on the need for further control of particulate emissions from stationary and portable diesel-fueled engines. The outline also identifies the types of information that will need to be collected and reviewed, as well as how the information can be presented.

#### **Task I. Collect Information**

- Inventory (i.e. current and future)
- Emission Factors (i.e. stationary and portable)
- Control Measures

#### **Task II. Establish Categories & Estimate Population**

- For Example: Backup, Low Use, and High Use
- Identify horsepower ranges to aid in the control technology evaluation (e.g. <50 bhp, 50-175 bhp, 175-750 bhp & >750 bhp<sup>1</sup>)

**Example Table 1 - Current Statewide Population of Stationary Diesel Engines**

<b>Categories</b>	<b>&lt; 50 bhp</b>	<b>50 - 175 bhp</b>	<b>175 - 750 bhp</b>	<b>&gt; 750 bhp</b>
A - Backup				
B - Low Use				
C - High Use				

#### **Task III. Estimate Emissions**

- Identify Emission Factors
- Estimate Current Emissions
- Estimate Future Emissions From Implementing Existing Measures

**Example Table 2 - Current Statewide Emissions from Stationary Diesel Engines**

<b>Categories</b>	<b>&lt; 50 bhp</b>	<b>50 - 175 bhp</b>	<b>175 - 750 bhp</b>	<b>&gt; 750 bhp</b>
A - Backup				
B - Low Use				
C - High Use				

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<sup>1</sup>These horsepower ranges are consistent with the federal nonroad engine horsepower categories.

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**Task IV. Evaluate Control Measures**

- Summarize Available Control Measures
- Compare Available Control Measures
- Identify Feasible/Cost Effective Measures For Each Category

**Example Table 3 - Comparison of Measures that Reduce Particulate Emissions**

<b>Example Control Measures</b>	<b>PM Reduction (%)</b>	<b>Initial Cost (\$)</b>	<b>Adverse Impacts or Incompatibility</b>
Exhaust Control Technologies			
Early Engine Phase-out			
Changes to Diesel Fuel			
Fuel Conversions			
etc...			

**Evaluation of PM Control Measures by Category and Horsepower Range**

- Using a top down approach, evaluate the feasibility and cost effectiveness of applying each control measure to each category of diesel engines. Identify the most effective (in terms of emission reduction) control measure that is both technically feasible and cost effective. Using the inventory, calculate average engine horsepower within each range, and estimate annual hours of operation based on available information.

1. Category A (Backup) <50 bhp
2. Category A (Backup) 50 - 175 bhp
3. Category A (Backup) 175 - 750 bhp
4. Category A (Backup) >750 bhp
5. Category B (Low Use) <50 bhp
6. Category B (Low Use) 50 - 175 bhp
7. Category B (Low Use) 175 - 750 bhp
8. Category B (Low Use) >750 bhp
9. Category C (High Use) <50 bhp

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10. Category C (High Use) 50 - 175 bhp

11. Category C (High Use) 175 - 750 bhp

12. Category C (High Use) >750 bhp

**Example Table 4 - Feasible Particulate Emission Reductions**

Categories	< 50 bhp	50 - 175 bhp	175 - 750 bhp	> 750 bhp
A - Backup	%	%	%	%
B - Low Use	%	%	%	%
C - High Use	%	%	%	%

**Task V. Estimate Emission Reductions**

- Feasible/Cost Effective Control Measures

**Example Table 5 - Diesel Engine Emissions with Implementation of Control Measures**

Categories	< 50 bhp	50 - 175 bhp	175 - 750 bhp	> 750 bhp
A - Backup				
B - Low Use				
C - High Use				

**Task VI. Evaluate Exposure & Risk**

- Current Inventory & Emissions
- Implementing Existing Measures
- Implementing Feasible/Cost Effective Control Measures

**Task VII. Select and Rank Control Measure(s)**

**Example Table 6 - Feasible & Cost Effective Control Measures**

Control Measure	\$/lb PM	\$/risk	Emission Reduction	Risk Reduction	Timing

**Task VIII. Draft Needs Assessment Report**